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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/629,127

07/29/2003

Chris E. Barns

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08/26/2004

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EXAMINER

DUONG, KHANH B

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/629,127

Applicant(s)

BARNS ET AL.

Examiner

Khanh Duong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 20-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

This Office Action is in response to the Amendment filed June 7, 2004.

Accordingly, claims 1, 14 and 19 were amended.

Currently, claims 1-19 are active, and claims 20-24 remain withdrawn from consideration as being directed to a non-elected invention.

Claim Objections

Claims 15-19 are objected to because of the following informalities:

Claims 15, 16 and 18, "the polysilicon gate structure" should be --the first polysilicon gate structure-- for constancy.

Claim 17, "a polysilicon gate structure" should be --the first polysilicon gate structure-- for constancy.

Claim 19, "said polysilicon gate structure" should be --said first polysilicon gate structure-- for constancy.

Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The step "replacing the polysilicon gate structure ... with a metal gate replacement" is also recited in claim 14.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 and 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (US 6,258,648), cited in previous Office Action.

Re claims 1-6 and 10-12, Lee discloses in FIGs. 2-6 [see accompanying text] a method comprising: covering a first polysilicon gate structure 10 with a silicon nitride hard mask 26 to prevent the formation of a silicide 32 on the first polysilicon gate structure 10; forming a sidewall spacer 12 that extends along the length of said first polysilicon gate structure 10 and at least partially along the length of said mask 26, wherein the sidewall spacer is below said mask 26 and prevents lateral silicide formation on either side of the first polysilicon gate structure 10; removing the mask 26 over a second polysilicon gate structure 10 to form a silicide 32 on the second polysilicon gate structure 10; etching to remove the mask 26 after forming the silicide 32; forming the first polysilicon gate structure 10 including a patterned polysilicon portion and an underlying dielectric layer 8; and using the mask 26 to protect the underlying dielectric layer 8 from overetching.

Re further claim 11, the functional recitation “protecting the underlying dielectric from overetching” has not been given patentable weight because it is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a “means” for performing the specified function, as set forth 35 U.S.C. 112, 6th paragraph, and must be supported by

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recitation in the claim of sufficient structure to warrant the presence of the functional language.

In re Fuller, 1929 C.D. 172; 388 O.G. 279.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Kim et al. (US 6,586,288), cited in previous Office Action.

Re claims 7 and 8, instead of polishing, Lee discloses etching to remove the hard mask 26 [see col. 4, ln. 53-55].

Kim et al. ("Kim") suggests removing a hard mask 31 by etching or polishing [see col. 5, ln. 58-62].

Since Lee and Kim are both from the same field of endeavor, the purpose disclosed by Kim would have been recognized in the pertinent prior art of Lee.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee as suggested by Kim because removing a hard mask by etching and polishing were art-recognized equivalent techniques as demonstrated by Lee and Kim at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute one technique for the other.

Claims 9 and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Gardner et al. (US 6,043,157), cited in previous Office Action.

Lee discloses a method previously as described, which method is repeated herein.

Re claims 9 and 14-19, Lee fails to disclose replacing the first polysilicon gate structure with a metal gate replacement.

Gardner et al. ("Gardner") suggests in FIGs. 2A-2F replacing a polysilicon gate structure 207b with a metal gate replacement 223 for the purpose of forming a temperature sensitive gate electrode [see col. 4, ln. 10-24].

Since Lee and Gardner are both from the same field of endeavor, the purpose disclosed by Gardner would have been recognized in the pertinent prior art of Lee.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee as suggested by Gardner, since Gardner states at column 4, lines 52-55 that such modification would further enhance device performance by increasing the speed of the device.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Wang et al. (US 6,248,002), cited in previous Office Action.

Re claim 13, Lee fails to disclose using a two-step polish to remove said mask including a first step using a harder pad and a second step using a softer pad.

Wang et al. ("Wang") expressly suggests in FIG. 6 using a three-step polish including a first step using a harder pad and a second step using a softer pad.

Since Lee and Wang are both from the same field of endeavor, the purpose disclosed by Wang would have been recognized in the pertinent prior art of Lee.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Lee as suggested by Wang, since Wang states in the ABSTRACT that such modification would prevent the accumulation of particle impurities on the surface of a semiconductor substrate that contains wofram plugs during the process of polishing the surface of the wafer.

Response to Arguments

Applicant's arguments filed June 7, 2004 have been fully considered but they are not persuasive.

Applicant argues that Lee fails to disclose "a sidewall spacer that protects the side of both the polysilicon gate structure and extends over the mask as well" (emphasis added). However, it is noted that such features are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant further argues that the combination of Lee and Gardner “still does not teach forming a silicide on one gate structure and replacing the other gate structure”. In response, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Gardner is shown to cure the deficiency of Lee by suggesting the polysilicon gate structure 207b be replaced with a metal gate replacement 223 for the purpose of forming a temperature sensitive gate electrode [see col. 4, ln. 10-24].

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

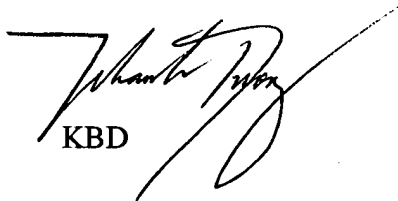
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (571) 272-1836. The examiner can normally be reached on Monday - Thursday (9:00 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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